Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte HWAN-YOUNG CHOI and JIN-SEUNG CHOI

Appeal No. 2000-1632
Application No. 09/055,308

ON BRIEF

Before COHEN, ABRAMS, and STAAB, Administrative Patent Judges.
STAAB, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1-13, all the claims pending in the application.

The claims on appeal are drawn to an apparatus for balancing a rotating member, and are reproduced in the appendix to appellants' main brief.[1]

[1]In claim 10, next to the last line, "alternating" should be --alternately--.

The references applied in the final rejection are:

Rumsey	3,049,941	Aug. 21, 1962
Goodrich et al. (Goodrich ‘688)	3,696,688	Oct. 10, 1972
Goodrich et al. (Goodrich ‘923)	3,733,923	May. 22, 1973

The claims on appeal stand rejected as follows:

(1) Claim 8, under 35 U.S.C. § 112, second paragraph, as being indefinite;

(2) Claims 1-3, 9 and 10, under 35 U.S.C. § 102(b), as being anticipated by Rumsey;

(3) Claim 6, under 35 U.S.C. § 103, as being unpatentable over Rumsey in view of Goodrich ‘923;

(4) Claim 7, under 35 U.S.C. § 103, as being unpatentable over Rumsey in view of Goodrich ‘688;

(5) Claims 4, 5, 8 and 11-13, under 35 U.S.C. § 103, as being unpatentable over Rumsey.

Rejection (1).

In rejecting claim 8 as being indefinite, the examiner has taken the position that the scope of the term “diamond-like

carbon" is unascertainable. Appellants respond that the term "diamond-like carbon" is an art-recognized term, whose meaning would be readily understood by a person of ordinary skill in the art. In the reply brief, entered and considered by the examiner, appellants attach a copy of US Patent 5,482,602, issued prior to appellants' filing date, in support of this position.

The background section of the '602 patent does indeed have an extensive explanation of what constitutes a "diamond-like carbon" substance. In light of this evidence, appellants' position that "diamond-like carbon" is a term of art, whose meaning would be readily understood by an ordinarily skilled artisan, is well taken. The standing § 112, second paragraph, rejection will therefore not be sustained.

Rejection (2).

Independent claim 1 reads as follows (emphasis added):

1. An apparatus for balancing a rotating member, comprising:

a groove having a predetermined depth and width and formed in the thickness along *a circumference* of a turntable having a center equal to a rotational center of said rotating member; and

a plurality of balls disposed in said groove, wherein said plurality of balls includes first balls formed of a first

material and second balls formed of a second material that is different from said first material, wherein said first and said second balls are *alternately disposed* in said groove.

Independent claim 10 is similar, except that instead of calling for first and second balls formed of different materials, the last paragraph of claim 10 requires that the plurality of balls disposed in the groove "are divided into first balls each having a first diameter and second balls each having a second diameter that is different from said first diameter."

The following represents our findings of fact with respect to the scope and content of the Rumsey reference.

We find that Rumsey is directed to a vibration damper structure adapted to be secured to a rotating shaft (column 1, lines 12-15). The damper structure of Rumsey comprises a casing 11 formed by sections 19 and 20 to jointly define a chamber 15 therebetween (column 2, lines 14-16). An inertia member 12 of high moment of inertia is supported in the chamber 15 (column 2, line 72, through column 3, line 5). The inertia member 12 and the casing sections 19 and 20 are provided with recessed bearing tracks for receiving plastic bearing balls 13 to restrict axial and radial movement of the inertia member relative to the

casing, leaving angular movement as the sole freedom of motion of the inertia member (column 3, lines 17-43). The bearing balls 13 support the inertia member at a *circumference* of the inertia member 12 and at a *circumference* of the chamber 15 (column 3, lines 26-29). The inertia member is yieldably coupled to the casing by means of a viscous dampening fluid contained in the casing chamber (column 4, lines 1-6). Intermixed with the plastic bearing balls 13 are non-load-bearing steel spheres 14 of smaller diameter than the plastic bearing balls, the steel spheres acting as spacers between adjacent plastic bearing balls so that fewer plastic bearing balls need be provided (column 3, lines 54-75). Figure 3 is a *fragmentary sectional* view illustrating the embodiment where steel spheres are used as spacers (column 1, lines 63-64).

We also find, in light of the fact that Figure 3 is a *fragmentary sectional* view of the damper, and in light of the fact that the entire weight of the heavy inertia member is retained by the plastic bearing balls against both axial and radial movement, leaving only angular movement as its sole freedom of movement, that an artisan would view Rumsey's Figure

3 as being a convenient way of representing an arrangement of plastic bearing balls and steel spheres that continues in a similar fashion all the way around the circumference of the bearing tracks. Still further, we find that an artisan would view Rumsey's statement that "a spacer [singular] or spacers [plural] of selected length may be used between adjacent nylon balls 13" (column 3, lines 73-75), when taken in conjunction with Figure 3, as a disclosure that either one steel sphere per plastic bearing ball or multiple steel spheres per plastic bearing ball may be utilized to reduce the number of plastic bearing balls required, so long as the number of plastic bearing balls used is sufficient to support the heavy inertia member in the manner called for at column 3, lines 40-43. Finally, based on the above findings, we find that an artisan would view Rumsey's Figure 3 as a disclosure of a plastic bearing ball and steel sphere arrangement wherein the plastic bearing balls and steel spheres are *alternately disposed* in the bearing tracks.

We now consider appellants' argument concerning the alleged differences between the apparatus of Rumsey and the subject matter of claims 1 and 10.

Concerning the examiner's anticipation rejection of claims 1 and 10 based on Rumsey, appellants argue (main brief, page 6) that the bearing tracks 35, 36 of Rumsey are not along the circumference of the vibration damper because they are not located at the outer boundary of the vibration damper assembly. For the following reasons, this argument is not well taken. First, claims 1 and 10 do not require the groove in which the balls are disposed to be formed along the circumference of the overall apparatus, as appellants imply, but rather along the circumference of "a turntable," which turntable may merely be a component of the overall apparatus. Second, while we appreciate that the definitions of the words "circumference" and "boundary" cited by appellants on page 6 of the main brief indicates that "circumference" may mean the external or outmost boundary or surface of a figure or object, we observe that other broader definitions of "circumference" and "boundary" also can be found[2] that support the examiner's position that the bearing tracks of

[2]See, for example, the American Heritage Dictionary of the English Language, 3rd edition, copyright © 1992, wherein the noun "circumference" may mean "the boundary of a circle" or "the boundary line of a figure, area, or object," and the noun "boundary" may mean "something that indicates a border or limit."

Rumsey's damper may be fairly regarded as being formed along a circumference of the device. Third, claims 1 and 10 merely call for the ball receiving groove to be formed along "a circumference" (as opposed to "the circumference") of a turntable, with the clear implication being that the turntable may have more than one circumferential boundary. Fourth, and most importantly, the Rumsey reference itself describes the bearing tracks of the damper as being "at a circumference" of the inertia member 12 and "at a circumference" of the chamber 15 (column 3, lines 26-29).

Appellants argue (main brief, page 6) that Rumsey's "mixture" of plastic bearing balls and steel spheres is never described as having the plastic balls and steel spheres in an alternate, or every other, type of arrangement. We acknowledge that Rumsey never uses the word "alternate" to describe the arrangement of bearing balls and spacer elements; however, that fact is not dispositive. For the reasons articulated *supra* in the findings of fact portion of this decision, we are of the opinion that an artisan would have viewed the disclosure of Rumsey as teaching an arrangement of plastic bearing balls and steel spheres wherein the balls and spheres alternate.

Appellants argue (main brief, page 8) that Rumsey's turntable does not have a center equal to a rotational center of the rotating member that is balanced by the apparatus. To the extent this argument is understood, it is not persuasive. From our perspective, Rumsey's "turntable" (i.e., the casing and inertia member considered collectively) has a "center" (central axis of rotation) that coincides with the "center" (central axis of rotation) of the member 18 that it balances.

Appellants argue (main brief, page 8) that if the pattern shown in Figure 3 of Rumsey is repeated, an alternating ball and sphere arrangement will not result. We do not agree with this argument, primarily because we consider it to be based on an erroneous interpretation of what Figure 3 of Rumsey depicts.

Appellants' arguments in the reply brief concerning the anticipation rejection of claims 1 and 10 also have been considered, but are adequately addressed by our views as set forth above.

In light of the foregoing, the anticipation rejection of claims 1 and 10 is sustained. The anticipation rejection of claim 2 is also sustained, since this claim has not been argued apart from claim 1 from which it depends.

Claim 3 depends from claim 1 and requires the first and second balls to be formed of nonmagnetic material. In rejecting this claim, it appears that the examiner is mixing and matching various elements from the Figures 3 and 5 embodiments of Rumsey in an effort to arrive at the subject matter of this claim. This approach is improper. In that the examiner has not persuasively established that Rumsey discloses using nonmagnetic material for both the bearing balls and spheres in a single disclosed embodiment, the anticipation rejection of claim 3 cannot be sustained.

Claim 9 depends from claim 1 and adds that the sum of the number of first balls and the number of second balls is an even number. In that we have found that Rumsey discloses an arrangement of plastic bearing balls and steel spheres wherein the balls and spheres alternate all the way around the bearing tracks, it necessarily follows that the sum of the number of plastic bearing balls and the number of steel spheres would be an even number. The anticipation rejection of claim 9 therefore is sustained.

Rejections (3) and (4).

Claims 6 and 7 depend from claim 2 and add that the second balls are made of chrome steel and stainless steel, respectively. The examiner relies on Goodrich '923 for its teaching of chrome plated balancing balls and Goodrich '688 for its teaching of stainless steel balancing balls and concludes that it would have been obvious to make the steel spheres of Rumsey of chrome steel or stainless steel in view of the teachings of the secondary references. We do not agree.

Rumsey expressly teaches (column 3, lines 54-75) that it is an economic advantage to use a mixture of nylon or other plastic balls and steel spheres because the steel spheres cost substantially less the plastic balls. In our view, this express teaching would act as a strong disincentive to the sort of modification proposed by the examiner because making the steel spheres of stainless steel or chrome steel would likely increase their cost and thus negate the very economic advantage Rumsey seeks to achieve.

Rejection (5).

Claims 4 and 5 depend from claim 2 and add that the first balls are made of beryllium copper alloy and bronze, respectively. Claim 8 depends from claim 1 and adds that the

first balls are surface treated by molybdenite and the second balls are surface treated by diamond-like carbon. Claim 11 depends from claim 10 and adds that the diameters of the smaller diameter balls is in the range of one-third to one-half the diameters of the larger diameter balls. Claims 12 and 13 depend from claim 3 and are similar to claims 4 and 5 in that they add to the claim from which they depend that the first balls are made of beryllium copper alloy and bronze, respectively.

The examiner's conclusion that these claims are unpatentable over Rumsey alone, notwithstanding the examiner's admission that Rumsey does not teach, suggest or imply what is additionally required by these dependent claims, is not sustainable in that there is no objective evidence to support the examiner's determinations of obviousness. *See, for example, In re GPAC, Inc.,* 57 F.3d 1573, 1582, 35 USPQ2d 1116, 1123 (Fed. Cir. 1995) (a factual basis is required to validate a claim rejection under
§ 103).

Summary.

The 35 U.S.C. § 112, second paragraph, rejection of claim 8 is reversed.

The anticipation rejection of claims 1-3, 9 and 10 is affirmed with respect to claims 1, 2, 9 and 10, but is reversed with respect to claim 3.

The obviousness rejections of claims 4-8 and 11-13 are reversed.

The decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

IRWIN CHARLES COHEN Administrative Patent Judge	)	
NEAL E. ABRAMS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LAWRENCE J. STAAB Administrative Patent Judge	)	

LJS/lp

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JUDGE STAAB

APPEAL NO. 2000-1632

APPLICATION NO. 09/055,308

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DECISION: **AFFIRMED IN PART**

PREPARED: Aug 15, 2002

OB/HD

PALM

ACTS 2

DISK (FOIA)

REPORT

BOOK